CHAPTER 7

Safety

7.1 FLIGHT PRECAUTION

7.1.1 General Precautions. Naval aircraft, including pre-accepted aircraft and public use aircraft modified by/for the Navy, shall not be operated in a nonstandard configuration or outside the limits of NATOPS without airworthiness approval in the form of a flight clearance document (per NAVAIRINST 13034.1) from NAVAIRSYSCOM.

7.1.1.1 Conduct of Flight. Pilots shall conduct their flights in such a manner as to avoid all unacceptable risks as determined by following the ORM process. Each pilot must exercise prudent judgment and take proper action (including modifying NATOPS procedures) when dictated by emergencies that endanger life or property. The decision to abandon aircraft should be tempered by the pilot's responsibility for the safety of lives that may be endangered by subsequent flight of a pilotless but controllable aircraft. It is the responsibility of the pilot/crew to aviate, navigate, and communicate, in that priority, throughout all aspects of both routine and unusual circumstances.

7.1.1.2 Liferafts. On overwater flights the number of persons in an aircraft shall not exceed capacity of the liferafts carried except as dictated by operational necessity.

7.1.1.3 Feathering or Securing Engines. During simulated emergency operations and functional checkflights of multiengine aircraft, no propeller shall be fully feathered or engine secured at an altitude below 4,000 feet above the terrain except as follows:

a. Aircraft undergoing test and trials as required by COMNAVAIRSYSCOM.

b. Aircraft whose design characteristics include normal operations with propellers feathered or engines secured below 4,000 feet.

Four-engine aircraft may operate with one propeller feathered or with one engine secured at altitudes of 1,500 feet above the terrain or higher when required for checkflights or training purposes subject to restrictions contained in the applicable NATOPS manual.

7.1.1.4 Conduct of Passengers. Passengers embarked in transport aircraft shall remain in its passenger compartments and shall not enter the pilot or crew compartments except on specific invitation of the aircraft pilot in command.

7.1.1.5 General Flight Personnel/Passenger Restrictions. Except for emergency or operational necessity, the number of persons aboard naval aircraft engaged in flight operations such as pilot checkout, night familiarization, carrier qualifications, instrument flying in single-piloted aircraft, or functional check-flight and evaluation shall be limited to those required to properly operate the aircraft and accomplish the assigned mission. When applicable, special precautions shall be observed in the weight and balance of the aircraft.

Note

Simulated emergencies that may affect aircraft controllability shall not be conducted anytime passengers are aboard the aircraft.

7.1.1.6 Operation of Battery Powered Devices. Crew/passengers shall not operate electronic equipment/battery powered devices such as radios, tape players, razors, calculators, etc., without approval of the pilot in command while the aircraft is in flight. Cellular telephones shall not be operated in naval aircraft while airborne.

7.1.1.7 Loading/Offloading. Whenever a fixed-wing aircraft is engaged in loading or offloading of

passengers, the engine(s) on the side of the aircraft from which loading or offloading is taking place shall normally be shut down. When the engine(s) cannot be secured during loading/offloading evolutions without adversely affecting the successful completion of the mission, care shall be taken to ensure that passengers are properly briefed and appropriate safety precautions are observed.

7.1.1.8 Adequate Cockpit Visual Lookout. The pilot in command of a naval aircraft with side-by-side cockpit seating arrangement shall be responsible for both seats being occupied at all times. On occasions when either pilots or copilots are absent from their seats, they should be relieved by another pilot or qualified crewmember who will carry out the responsibilities expected of a lookout. Functional checkflights of single-piloted aircraft may be exempt from this provision when deemed advisable by the commanding officer.

7.1.2 Starting, Turning, and Taxiing

7.1.2.1 Authorized Personnel. Engines shall not be started without a pilot or designated mechanic in the pilot seat. See paragraph 7.1.2.4 concerning helicopters/tilt-rotors.

7.1.2.2 General Prestart Precautions

a. Before starting an engine, the wheels of the aircraft shall be chocked and the parking brake set unless a deviation from this requirement is specifically authorized by the applicable model NATOPS manual.

b. Where applicable, intake screens shall be installed on jet aircraft.

c. Prior to starting jet engines, intakes and surrounding ground/deck shall be inspected to eliminate the possibility of FOD.

d. When an engine is started by nonpilot personnel for testing and warm-up purposes on aircraft other than transport and patrol class equipped with parking brakes, the plane shall be tied down.

e. Whenever an engine is started, personnel with adequate fire extinguishing equipment, if available, shall be stationed in the immediate vicinity of the engine but safely clear of intakes or propellers.

7.1.2.3 Starting Procedures. In starting an aircraft, all challenges and signals between the person operating the starting device and the person at the engine controls shall be clearly understood and so indicated by repetition before action is taken by either person. Where the engines are started entirely from the cockpit, the person at the engine controls shall exchange signals with a person observing the engine from outside the aircraft. In all cases, the propeller or jet intake duct and engine outlet, as applicable, shall be declared all clear prior to starting. Similarly, the rotor(s) of helicopters and prop-rotors of a tilt-rotor shall not be engaged unless the individual in the cockpit is assured by positive signal that the area swept by the rotor(s) or prop-rotors is "all clear."

7.1.2.4 Helicopters/Tilt-Rotors. When the engine of a helicopter/tilt-rotor is started, the controls should be manned by a qualified helicopter/tilt-rotor pilot. Commanding officers may authorize certain specially qualified personnel, other than pilots, to ground test helicopter/tilt-rotor engines and avionics when a pilot is not available; however, prop-rotors and rotors of a tilt-rotor shall not be engaged except by a qualified pilot. Commanding officers of naval aviation depots and naval facilities may authorize qualified civilian employees to start engines and engage rotors or prop-rotors for ground system checks. Aircraft security requirements (e.g., tiedowns, chocks, parking brakes, etc.) shall be in accordance with applicable NATOPS.

7.1.2.5 Turnup. Before starting an engine for a high power turnup, aircraft other than transport and patrol class aircraft shall be tied down and placed in such a manner that the propeller or jet blast will not cause damage to other aircraft, equipment, or property. During any ground runup, an outside observer shall be stationed in such a location as to be in view of the person at the controls at all times.

7.1.2.6 Taxiing

a. When taxiing in the close vicinity of obstructions or other aircraft, a qualified taxi director shall attend the taxiing aircraft as well as other ground personnel necessary to ensure safe taxiing.

Note

The pilot in command is responsible for safe taxi clearance from obstacles and other aircraft. When uncertain of safe taxi clearances, stop and utilize appropriate ground personnel prior to continuing to taxi.

b. Instructions and use of plane handling signals appear in NWP 3-04.1M, the Aircraft Signals NATOPS Manual, and posters and pamphlets issued by CNO. All naval activities are directed to comply with these instructions.

7.1.3 Takeoff

7.1.3.1 Flight Personnel and Passenger Briefing. The pilot in command of a naval aircraft shall ensure that prior to takeoff, flight personnel and passengers are adequately instructed on personal safety and survival equipment and procedures required for the particular aircraft in which they embark. Pilots of helicopters and tilt-rotors that embark passengers are released from briefing responsibilities while engaged in:

a. SAR missions

b. Transporting large troop contingents, reconnaissance parties, patrols, and outposts during field problems or when no opportunity is provided for the aircraft to be shutdown after embarkation

c. Shipboard operations when landings are precluded.

Under such circumstances, the briefing shall be the responsibility of the cognizant local commander(s).

7.1.3.2 Loose Articles. Prior to aircraft takeoff, an inspection shall be made to ensure that no loose articles, such as rags, waste, tools, etc., are present that might foul the controls. Articles shall be properly stowed to prevent their coming adrift and being lost overboard or damaging the aircraft during maneuvers. Care shall be taken to ensure proper load-balance distribution of all weights.

7.1.4 Takeoff and Landing Checklists. NATOPS checklists shall be provided in each aircraft for mandatory use by pilots to assist them in preparing the aircraft for takeoff and landing. They shall be followed carefully and in their given order to ensure that all steps are performed.

Note

In compliance with aircraft military design specifications, most aircraft are provided with abbreviated takeoff and landing checklists placarded (or etched) on instrument panels. The checklists are an additional reminder to flight personnel to complete required NATOPS manual checklists and serve as a double check on the proper positioning and status of major aircraft systems.

7.1.5 Power Failure on Multiengine Aircraft

7.1.5.1 Twin-Engine Aircraft. In the event of power failure or whenever an engine is stopped as a precaution on an aircraft that has two engines, the pilot in command shall land at the nearest suitable airport, in terms of time, provided weather conditions, terrain, and facilities available indicate that a safe landing can be accomplished.

7.1.5.2 Aircraft With Three or More Engines. In the event of a single power failure or whenever not more than one engine is stopped as a precaution on an aircraft that has three or more engines, the pilot in command may proceed to a selected destination if, after considering the following, the pilot in command decides that proceeding to that destination is as safe as landing at the nearest suitable airport:

a. The nature of the malfunction and the possible mechanical difficulties that may occur if flight is continued.

b. The altitude, weight, and usable fuel at the time of engine stoppage.

c. The terrain and weather conditions en route and at suitable landing points.

d. Possible air traffic congestion at suitable landing points.

e. Pilot familiarity with the airport to be used.

7.1.5.3 Reports. Pilots in command shall report in-flight power failures and/or precautionary engine stoppages that affect safety of flight to the appropri-

ate ground station as soon as practicable and shall keep appropriate operational control centers and/or traffic control facilities advised of their intentions and flight progress.

7.1.6 Distress and Emergency

7.1.6.1 Distress Procedures. Distress frequencies, procedures, signals, and call signs may vary among theaters of operations and are contained in various directives such as Joint Pub 3-50, DOD FLIPS, and ICAO publications. A copy of the applicable procedures and signals shall be carried in the cockpit of all naval aircraft and may be used in time of peace regardless of the degree of radio silence that may be imposed during tactical exercises. They will be used in time of war when prescribed by the officer in tactical command and may be amplified as necessary to cover local conditions or special operations.

7.1.6.2 Emergency Procedures. Forced landing, lost aircraft, and search and rescue procedures applicable to aircraft are contained in various directives such as NWPs; Joint Army, Navy, Air Force Publications (JANAPs); and ICAO publications. Commanding officers shall ensure that each pilot under their command is thoroughly cognizant of applicable directives.

7.1.7 Ditching and Bailout

7.1.7.1 Ditching Precautions. When an aircraft must be crash landed on either land or water, the sudden shifting of cargo, equipment, and other heavy items may cause injury or loss of life. All units shall arrange and secure equipment in their aircraft to guard against such dangers. Emergency gear such as liferafts should be properly stowed for quick availability. Responsibility for proper security of cargo and equipment lies with the pilot in command of each aircraft.

7.1.7.2 Procedures. Ditching and bailout bills shall be prominently displayed in all multipiloted aircraft having embarked flight personnel and/or passengers. Frequent drills shall be held to familiarize flight personnel with these instructions. Ditching and bailout signals shall be accompanied by simultaneous parallel announcements on the ICS or public address system whenever practicable.

Note

Bailout bills shall not be required in helicopters; however, strict compliance with the provisions of paragraph 7.1.3 is mandatory.

7.1.8 Command and Control Communication. Change in the control of aircraft shall be effected in a positive manner. As a minimum, a simple voice procedure (ICS or oral) shall be used to effect transfer of control responsibility. Pilots exercising control are responsible until they acknowledge verbally the relieving pilots acceptance of control of the aircraft. Where noise level, cockpit configuration, or other conditions prevent a positive verbal exchange, the following procedure shall be used:

a. The pilot desiring to be relieved or pilot desiring to take control shall shake control stick or column.

b. Pilots taking control shall shake control stick or column.

c. Pilot being relieved shall hold both hands overhead and observe the relieving pilot.

d. Pilots who have taken control shall signify this fact definitely by placing their hand on their head when the other pilot is looking at them. The pilot originally in control shall not be considered relieved until the foregoing has been executed, and responsibility for control of the aircraft rests upon the pilot until that has occurred.

e. In aircraft where visual contact between the two control positions is impossible or unsatisfactory, shift of control shall be attempted only when an operative interphone system is provided.

f. In high-performance multicrew jet aircraft, the pilot ICS shall be selected to the "Hot Mic" position in aircraft so equipped for all takeoffs and landings, and when taxiing on an aircraft carrier deck. Below 2,500 feet AGL, "Hot Mic" shall always be selected unless the use of "Hot Mic" would significantly detract from the safety or mission effectiveness of the flight. Further use of "Hot Mic" should be prescribed in the individual flight manuals as appropriate to the installed system, mission requirements, and emergency capabilities.

7.1.9 Tobacco Products in Aircraft

a. The use of tobacco products in naval aircraft is prohibited.

b. Lighter Prohibition. Lighters with plastic liquid reservoirs and/or containers for refilling any lighter are prohibited in naval aircraft. Lighters with butane, propane, or methyl alcohol as a fuel are also prohibited.

7.2 PREVENTION OF CARBON MONOXIDE AND OTHER TOXIC BY-PRODUCT CONTAMINATION

a. General Carbon monoxide, the most common toxic gas of combustion, as well as other toxic gases such as aldehydes present a serious safety of flight hazard. Prior to service acceptance, aircraft are tested to ensure an acceptable carbon monoxide level during operation. Such factors as wear and deterioration of airframe seals and opening of seams may increase susceptibility to carbon monoxide contamination.

b. Test procedures and technical directives. Test procedures are outlined in MIL-STD-800 that also references other pertinent technical directives on this subject.

c. Flight personnel procedures. Adherence to the following procedures will reduce the risk of gaseous intoxication.

(1) Pay particular attention to the detection of exhaust fumes and to physical symptoms indicating poisoning. If toxic gases are suspected prior to takeoff, the flight shall be discontinued until the source of contamination is determined and eliminated.

(2) When installed, select 100-percent oxygen regardless of altitude whenever carbon monoxide or other noxious or irritating gas is present or suspected. Use 100-percent oxygen until danger is past or flight is completed. If necessary, activate emergency oxygen supplies.

(3) Take precautions during ground operations to avoid contamination of the aircraft either by its own exhaust or by exhaust gases of adjacent aircraft.

(4) In helicopters and tilt-rotors, avoid hovering with engine exhaust to windward.

(5) During preflight inspection, ensure that all fuselage openings, torpedo doors, and other access doors are properly secured.

7.2.1 Safety Belts and Shoulder Harnesses.

Each persons safety belt and shoulder harness shall be worn and tightened prior to takeoff and shall be worn until completion of the flight except when necessary activities require temporary removal. Inertia reels, where provided, shall be manually locked for all takeoffs and landings and at all other times when high g forces may be encountered except where the procedure is detrimental to safe operation. The number of persons over 2 years of age embarked in a naval aircraft for flight shall be restricted to the number for which there are adequate seats and safety belts. During takeoffs, landings, and at other times as specified by the pilot in command, each person over 2 years of age on board transport aircraft shall occupy a seat or berth and be secured with the safety belt provided for that purpose. TYCOMs may authorize waivers of cabin seating requirement for helicopters and tilt-rotors when operational environment or aircraft configuration/load requirements dictate for the accomplishment of essential training and operations. Waiver should be granted with following guidelines:

a. Only applies to special operations training and missions.

b. Not to be used for routine operational training or personnel transfers. Applies only when unique special operation requirements exist for a specific mission or exercise.

c. When seats are removed, passengers will be restrained by an appropriate alternate means.

d. If mission profile requires waiver of seats/ seatbelts/ restraints for one part of the mission, then passengers shall use seats/ seatbelts/restraints for all other phases of the mission.

WARNING

Walkaround belts do not provide impact protection; therefore, use of those belts shall be restricted to only those occurrences when mission accomplishment requires persons to be out of their seat. Such belts shall not be worn when strapped into a seat.

Note

Flight personnel leaving their seats to open a hatch or work in the vicinity of an open hatch shall wear an approved crewman aircraft belt (walkaround) during time spent out of the seat.

7.2.2 Reclining Seats. Personnel embarked in aircraft equipped with seats that have a reclining back shall be instructed to lock the seat in the erect position for all takeoffs, landings, and emergencies.

WARNING

Reclining seats that will not lock in the erect position shall not be used for passenger transport.

7.2.3 Unusual Performance of Aircraft. Any abnormal, erratic, or other kind of unusual performance of an aircraft or its powerplant, including material failures, shall be reported in accordance with OPNAVINST 3750.6 and OPNAVINST 4790.2.